CLAIMS

1. An apparatus comprising:

a first memory used for a motion estimation of a current block; and

a circuit configured to (i) determine if a search window for said current block is at least partially outside a boundary of a picture stored in a second memory, (ii) copy a first plurality of reference samples in said search window from said second memory to said first memory and (iii) map a plurality of reads from said first memory for a plurality of pad samples to said reference samples in said first memory, where said pad samples are determined to be outside said boundary.

2. The apparatus according to claim 1, wherein said circuit comprises a control circuit configured to determine if said search window is at least partially outside said boundary.

3. The apparatus according to claim 2, wherein said control circuit comprises a state machine configured to generate a plurality of map addresses and a state signal in response to a

position of a sub-window in said search window relative to said boundary.

4. The apparatus according to claim 1, wherein said circuit comprises a control circuit configured to generate an address to read from said first memory in response to a search address.

5. The apparatus according to claim 4, wherein said control circuit comprises:

a first circuit configured to generate an intermediate address in response to said search address; and

a second circuit configured to generate said address by comparing said intermediate address with one of a plurality of map addresses for a plurality of columns in said search window.

6. The apparatus according to claim 5, wherein said control circuit further comprises a third circuit configured to generate a plurality of flags in response to said search address relative to said boundary.

7. The apparatus according to claim 6, wherein said second circuit is further responsive to said flags that indicate one of (i) outside a left edge of said boundary, (ii) crossing said left edge, (iii) between said left edge and a right edge of said boundary, (iv) crossing said right edge and (iv) outside said right edge.

8. The apparatus according to claim 1, wherein said circuit comprises a control circuit configured to generate a plurality of signals that control mapping of said pad samples from said reference samples.

9. The apparatus according to claim 8, wherein said circuit comprises a shifter circuit configured to append said pad samples to at least one of said reference samples in response to said signals.

10. The apparatus according to claim 9, wherein said shifter circuit comprises:

a first shifter configured to generate a third plurality of said reference samples by shifting a second plurality of said reference samples read from said first memory;

a second shifter configured to generate a particular pad sample of said pad samples by shifting one of said third plurality of said reference samples; and

a plurality of multiplexers each configured to multiplex said particular pad sample and a corresponding one of said third plurality of said reference samples.

11. A method for supporting a motion estimation of a current block beyond a boundary of a picture, comprising the steps of:

(A) determining if a search window for said current block is at least partially outside said boundary;

(B) copying a first plurality of reference samples in said search window from a second memory to a first memory for said motion estimation; and

(C) mapping a plurality of reads from said first memory for a plurality of pad samples to said reference samples in said

first memory, where said pad samples are determined to be outside said boundary.

12. The method according to claim 11, further comprising the step of:

aligning a second plurality of said reference samples read from said first memory to a first plurality of current samples in said current block for comparison.

13. The method according to claim 12, further comprising the step of:

aligning said pad samples with a second plurality of said current samples for comparison.

14. The method according to claim 13, wherein said first plurality and said second plurality of said current samples comprise a 16 by 16 block.

15. The method according to claim 11, wherein step (B) comprises the sub-step of:

copying a number of blocks of said reference samples from said second memory to said first memory.

16. The method according to claim 15, wherein step (B) further comprises the sub-step of:

mapping an address of said number of blocks to align with said boundary.

17. The method according to claim 16, wherein said number of blocks comprises a 3-vertical by 5-horizontal arrangement of said blocks.

18. The method according to claim 11, wherein step (A) comprises the sub-step of:

determining a horizontal position of a block within said search window relative to said boundary.

19. The method according to claim 18, wherein step (A) further comprises the sub-step of:

determining a vertical position of said block relative to said search window after determining said horizontal position.

20. An apparatus comprising:

means for determining if a search window for a current block is at least partially outside a boundary of a picture;

means for copying a first plurality of reference samples in said search window from a second memory to a first memory for a motion estimation of a current block; and

means for mapping a plurality of reads from said first memory for a plurality of pad samples to said reference samples in said first memory, where said pad samples are determined to be outside said boundary.